
THE SOFTWARE INDUSTRY PROFILE:
A BRIEF REVIEW AND LOOK AHEAD

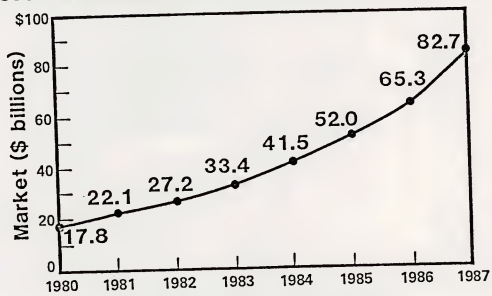
PRESENTED TO:
IBM SOFTWARE ENGINEERING INSTITUTE

DECEMBER 1, 1982

EDWARD I. METZ
SENIOR VICE PRESIDENT

INPUT

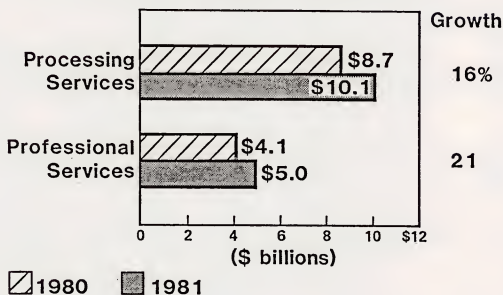
U.S. INFORMATION SERVICES MARKET



1982-1987 - 24% AAGR

INPUT

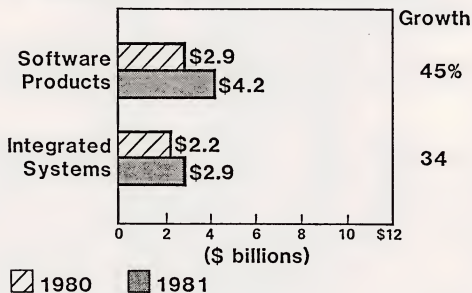
REVENUE GROWTH BY DELIVERY MODE (1980-1981)



INPUT



REVENUE GROWTH BY DELIVERY MODE (1980-1981)



INPUT

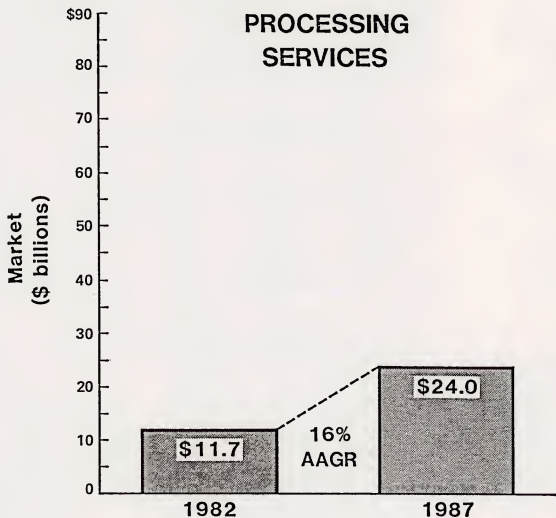


FORECAST PARAMETERS

- **Inflation 6% 1982-1987**
- **Corresponding Price Increases**
 - **4% Processing Services**
 - **5% Professional Services**
 - **5.5% Software Products**
 - **2% Integrated Systems**
- **Slow Recovery 1983-1984**
- **No Further Recession**

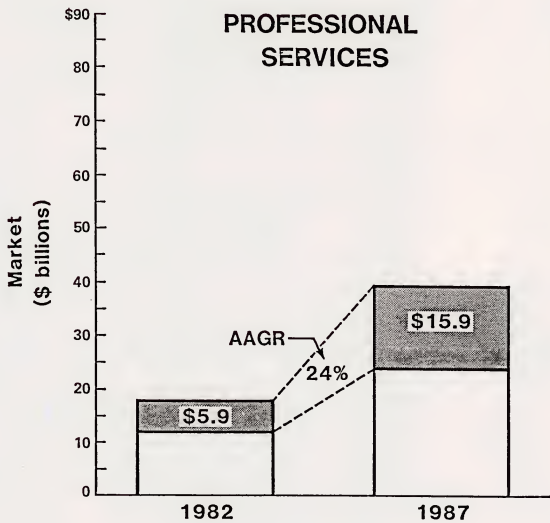
INPUT





INPUT

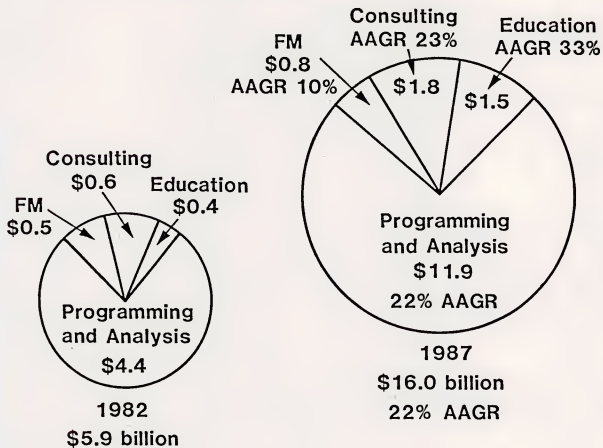




INPUT

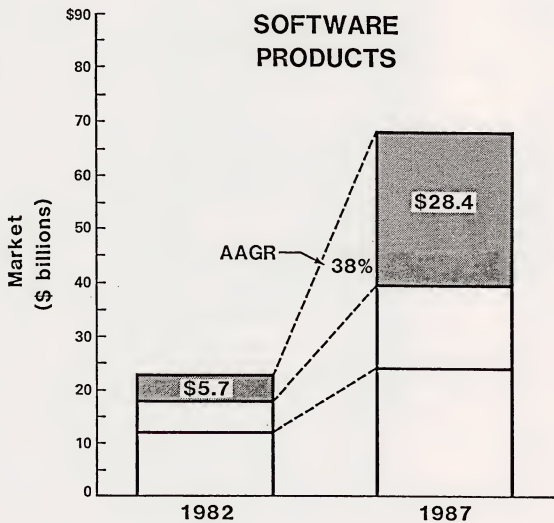


PROFESSIONAL SERVICES GROWTH



INPUT

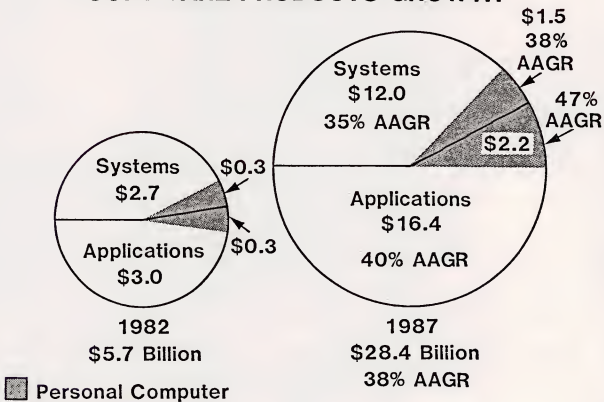




INPUT

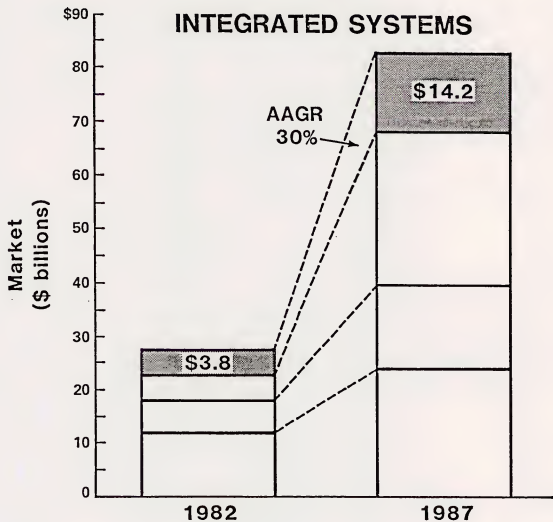


SOFTWARE PRODUCTS GROWTH



INPUT

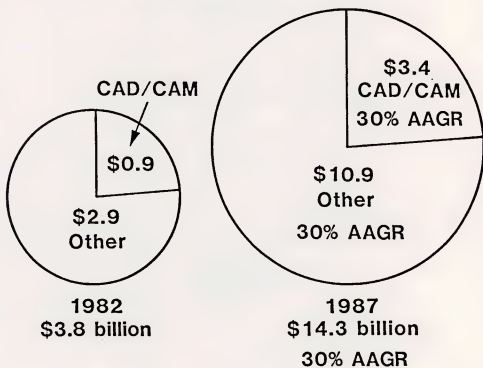




INPUT



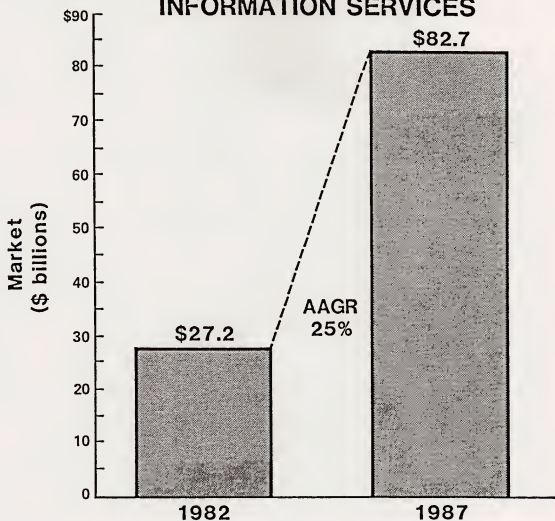
INTEGRATED SYSTEMS GROWTH



INPUT



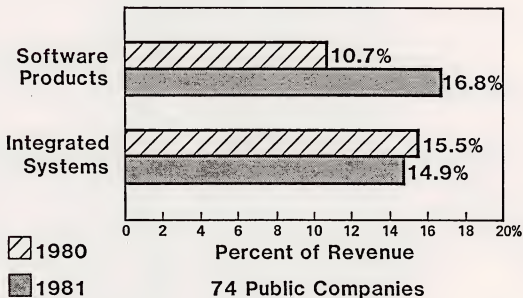
INFORMATION SERVICES



INPUT



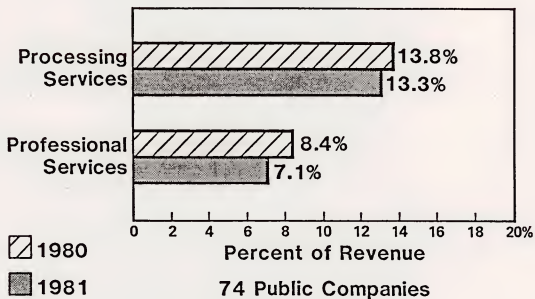
PROFIT MARGINS



INPUT



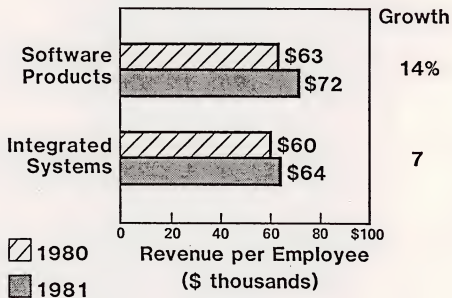
PROFIT MARGINS



INPUT



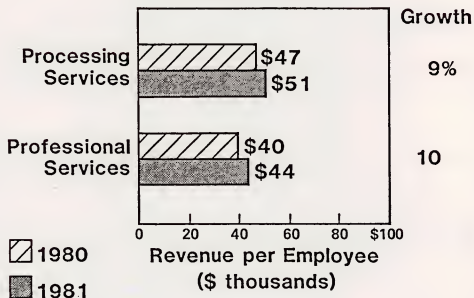
PRODUCTIVITY



INPUT



PRODUCTIVITY



INPUT



1983 PROCESSING SERVICES

- **Slower Growth**
- **Increasing Data Communication Costs**
- **Pressure From Smaller Systems**
- **Multiple Opportunities**
 - **Analytical-Based Systems**
 - **Industry Markets**
 - **New Delivery Modes**

INPUT



1983 SOFTWARE PRODUCTS

- Financial "Leader of the Pack"
- Danger From Product Obsolescence
- Growth Sources
- Opportunities
 - Integrated Product Lines
 - Personal Computers
 - Distribution

INPUT



1983 PROFESSIONAL SERVICES

- Thin Profit Margins
- More Complex Environments
- Alternative Delivery Modes
- Opportunities
 - Increased Specialization
 - Re-sellable Products, Packaging

INPUT



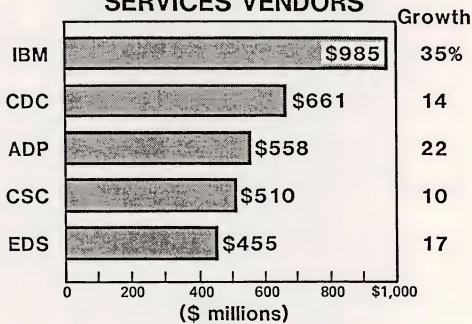
1983 INTEGRATED SYSTEMS

- **Rapid Growth Led By CAD/CAM**
- **More Competition**
- **Customer Support Costs**
- **Extent of Hardware Manufacturing**
- **Opportunities**
 - **Industry-Specialized Products**
 - **Network Connections**

INPUT



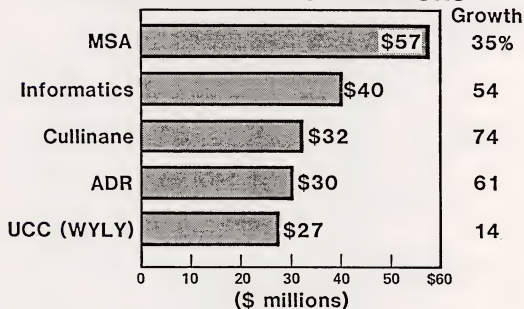
LARGEST INFORMATION SERVICES VENDORS



INPUT



LARGEST INDEPENDENT SOFTWARE PRODUCT VENDORS



INPUT



LARGEST SOFTWARE PRODUCTS VENDORS BY
NONCAPTIVE U.S. REVENUE

RANK		COMPANY	CALENDAR YEAR REVENUES (\$ millions)		1980/1981 PERCENT GROWTH
1981	1980		1980	1981	
1	1	International Business Machines (IBM)	\$595	\$815	37%
2	2	Control Data Corporation (CDC)	80	85	6
3	3	Sperry Corporation	55	67	22
4	4	Digital Equipment Corporation (DEC)	47	64	36
5	7	Management Science America, Inc. (MSA)	42	57	35
6	5	Burroughs Corporation	47	52	11
7	6	Honeywell, Inc.	45	50	11
8	9	Informatics General Corp.	26	40	54
9	11	Tandy Corporation	21	36	71
10	8	Hewlett-Packard Company (H-P)	28	34	21
11	15	Cullinane Database Systems	18	32	74
12	14	Applied Data Research (ADR)	19	30	61
13	10	University Computing (WYLY)	24	27	14
14	37	Apple Computer	7	26	304
15	13	Data General Corporation (DG)	19	26	37
16	18	Cincom Systems, Inc.	16	25	57
17	12	NCR Corporation	20	24	21
18	19	Kirchman Corporation	15	21	40
19	22	McCormack and Dodge	14	21	47
20.	16	Texas Instruments	18	20	11



FASTEST GROWING SOFTWARE PRODUCTS VENDORS WITH
NONCAPTIVE U.S. REVENUE OVER \$10 MILLION

1981 RANK	COMPANY	CALENDAR YEAR REVENUE (\$ millions)		1980/1981 PERCENT GROWTH
		1980	1981	
1	Softsel	\$ 0	\$14	6,900%
2	Visicorp	4	16	400
3	Apple Computer	7	26	304
4	Westinghouse Corporation	3	12	302
5	Policy Management Systems (PMS)	4	13	208
6	Lifeboat Associates, Inc.	4	11	163
7	Technicon Data Systems Corp.	8	19	129
8	Software AG of North America, Inc.	10	20	96
9	Tandem Computers, Inc.	9	17	84
10	Integrated Software Systems	6	11	75

NOTE: Growth rates are rounded and are based on revenues rounded to nearest thousand; revenues shown are rounded to the nearest \$1 million.



LARGEST APPLICATION SOFTWARE VENDORS BY
NONCAPTIVE U.S. REVENUE

RANK		COMPANY	CALENDAR YEAR REVENUES (\$ millions)		1980/1981 PERCENT GROWTH
1981	1980		1980	1981	
1	1	International Business Machines (IBM)	\$105	\$150	43%
2	2	Management Science America, Inc. (MSA)	42	57	35
3	3	Sperry Corporation	19	26	37
4	6	Informatics General Corp.	14	24	68
5	9	Digital Equipment Corporation (DEC)	14	22	57
6	5	Kirchman Corporation	15	21	40
7	7	McCormack and Dodge	14	21	47
8	4	Technicon Data Systems Corp.	18	20	12
9	14	Anacomp, Inc.	8	19	129
10	10	Burroughs Corporation	14	16	14
11	27	Policy Management Systems	4	13	208
12	17	Tandy Corporation	7	13	86
13	8	Insurance Systems of America (ISA)	14	13	(8)
14	65	Softsel	0	12	6,900
15	11	Honeywell, Inc.	11	12	9
16	12	University Computing (WYLY)	10	12	14
17	13	CAPEX	9	12	32
18	18	McDonnell Douglas Automation (MCAUTO)	7	12	71
19	19	Comserv Corp.	7	12	71
20	20	Integrated Software Systems	6	11	75



FASTEST-GROWING APPLICATION SOFTWARE VENDORS WITH
NONCAPTIVE U.S. REVENUE OVER \$5 MILLION

1981 RANK	COMPANY	CALENDAR YEAR REVENUE (\$ millions)		1980/1981 PERCENT GROWTH
		1980	1981	
1	Softsel	\$ 0	\$12	6,900%
2	Westinghouse Corporation	0	9	1,815
3	Dyatron Corp.	1	5	238
4	Policy Management Systems	4	13	208
5	Lifeboat Associates, Inc.	3	8	163
6	Anacomp, Inc.	8	19	129
7	Execucom Systems Corporation	5	9	90
8	NCA Corp.	5	9	88
9	Tandy Corporation	7	13	86
10	Thomas National Group	4	7	83

NOTE: Growth rates are rounded and are based on revenues rounded to nearest thousand; revenues shown are rounded to the nearest \$1 million.



LARGEST SYSTEM SOFTWARE VENDORS
BY NONCAPTIVE U.S. REVENUE

RANK		COMPANY	CALENDAR YEAR REVENUES (\$ millions)		1980/1981 PERCENT GROWTH
1981	1980		1980	1981	
1	1	International Business Machines (IBM)	\$490	\$665	36
2	2	Control Data Corporation (CDC)	80	85	6
3	5	Digital Equipment Corporation (DEC)	33	42	27
4	3	Sperry Corporation	36	41	14
5	4	Honeywell, Inc.	34	38	12
6	6	Burroughs Corporation	33	36	9
7	8	Cullinane Database Systems	18	32	71
8	9	Applied Data Research (ADR)	18	28	63
9	26	Apple Computer	7	26	304
10	7	Hewlett-Packard Company (H-P)	20	24	20
11	12	Cincom Systems, Inc.	15	24	56
12	14	Tandy Corporation	14	23	64
13	18	Software AG of North America, Inc.	10	20	96
14	11	NCR Corporation	16	19	21
15	16	Data General Corporation (DG)	13	18	39
16	28	Visicorp	4	18	400
17	10	Texas Instruments	16	18	11
18	13	Pansophic Systems, Inc.	15	18	21
19	19	Tandem	9	17	84
20	17	Informatics General Corp.	11	15	36

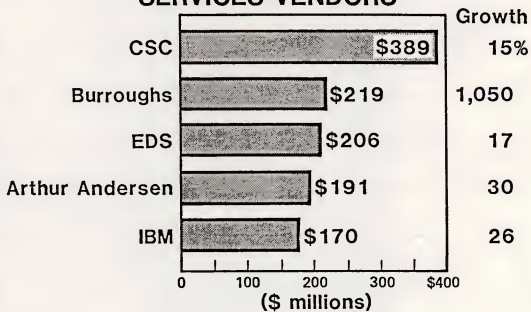
FASTEST-GROWING SYSTEM SOFTWARE VENDORS WITH
NONCAPTIVE U.S. REVENUE OVER \$10 MILLION

1981 RANK	COMPANY	CALENDAR YEAR REVENUE (\$ millions)		1980/1981 PERCENT GROWTH
		1980	1981	
1	Visicorp	\$ 4	\$18	\$400
2	Apple Computer	7	26	304
3	Software AG of North America, Inc.	10	20	96
4	Microsoft	5	10	89
5	Tandem Computers, Inc.	9	17	84
6	Cullinane Data Base Systems	18	32	71
7	Tandy Corporation	14	23	64
8	Applied Data Research (ADR)	18	28	63
9	Computer Associates, Inc.	8	13	55
10	Data General Corporation (DG)	13	18	39

NOTE: Growth rates are rounded and are based on revenues rounded to nearest thousand; revenues shown are rounded to the nearest \$1 million.



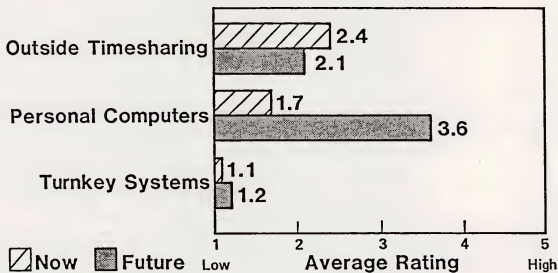
LARGEST PROFESSIONAL SERVICES VENDORS



INPUT



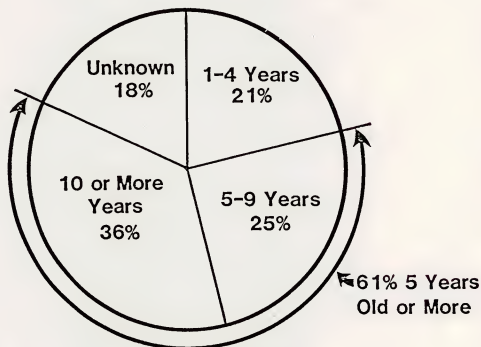
IMPORTANCE OF ALTERNATIVE SOURCES (END USERS)



17 Respondents

INPUT

USER SOFTWARE IS GETTING OLD



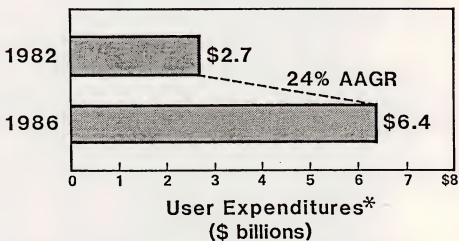
Age of Key Systems

28 Respondents

INPUT



BANKING INFORMATION SERVICES MARKET GROWTH

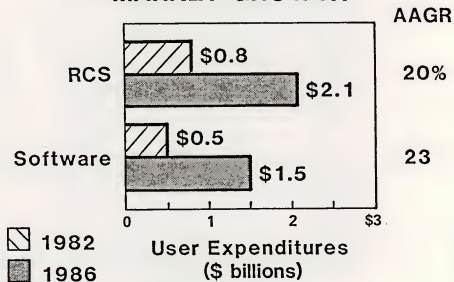


*Includes Processing Services, Software
and Professional Services

INPUT

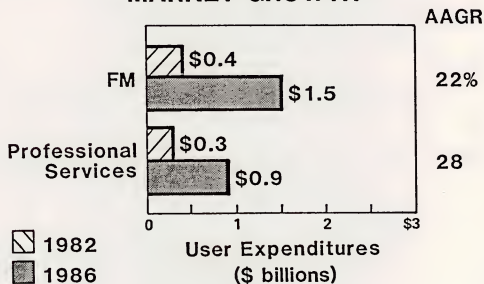


BANKING INFORMATION SERVICES MARKET GROWTH



INPUT

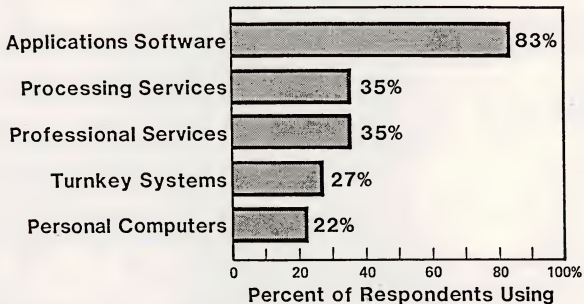
BANKING INFORMATION SERVICES MARKET GROWTH



INPUT



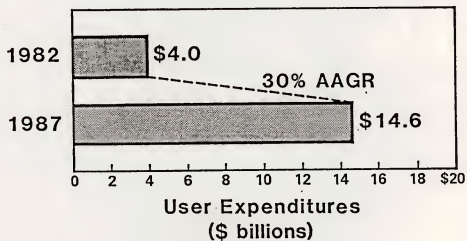
SERVICES USAGE



52 Respondents (Discrete Manufacturing)

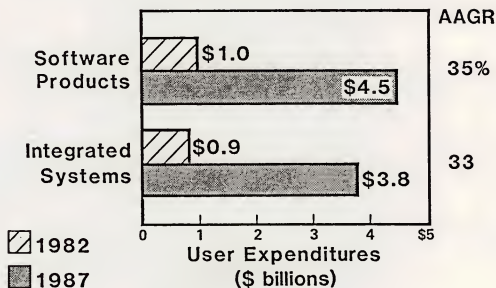
INPUT

DISCRETE MANUFACTURING INFORMATION SERVICES MARKET



INPUT

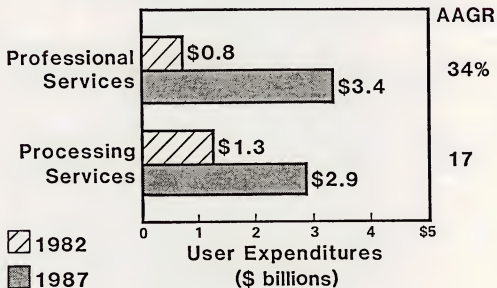
MARKET GROWTH BY MODE (DISCRETE MANUFACTURING)



INPUT



MARKET GROWTH BY MODE (DISCRETE MANUFACTURING)



INPUT

SOFTWARE PRODUCT CHALLENGES

- **Next Generation Software**
- **Better-Financed Competition**
- **Growth Sources**
- **Systems/Application Market
Differences**

INPUT



SOFTWARE PRODUCT REVENUE

Category	1981 Revenue
Product Sales	74%
Maintenance	19
Customization	2
Training and Documentation	5
Total	100%

29 Respondents

INPUT



SOFTWARE PRODUCT OPPORTUNITIES

- Multiple Funding Sources
- Integrated Product Lines
- Personal Computers
- Expanded Distribution Channels
- Acquisitions

INPUT



PROFESSIONAL SERVICE CHALLENGES

- Profit Margin Decline
- Proliferation of Technology
- Delivery Mode Options

INPUT



**PROFESSIONAL SERVICES REVENUE
BY SOURCE**

Revenue Source	1981 Revenue
Programming and Analysis	75%
Consulting Services	11
Facilities Management	9
Education and Training	6
Total	100%

INPUT



PROFESSIONAL SERVICES OPPORTUNITIES

- Top Management Selling
- More Specialization
- System Ownership
 - Software Products
 - Integrated Systems

INPUT



CHALLENGES INTEGRATED SYSTEMS

- **Competition From...**
 - **Smaller Systems**
 - **Hardware Manufacturers**
 - **RCS Vendors**
- **High Labor Content of Customer Support**

INPUT



INTEGRATED SYSTEMS REVENUE

Revenue Source	1981 Revenue
Hardware	72%
Software	13
Hardware Maintenance	11
Software Maintenance	4
Total	100%

16 Respondents

INPUT



INTEGRATED SYSTEMS OPPORTUNITIES

- **Provide More Interfaces**
- **New Customer Support Methods**
- **Increased Continuing Revenue**
 - **Maintenance**
 - **Support**

INPUT



FOCUS ON OPPORTUNITY

- **Software Products Success Requires . . .**
 - **Integrated Product Lines**
 - **Continuous, Correct Investment**
 - **Support Strength**
 - **Well "Packaged" Products**

INPUT



FOCUS ON OPPORTUNITY

- **Professional Services Opportunity**
 - **Specialization**
 - **Packaging**
 - **Leveraging Expertise**
 - **Promotion**

INPUT



SOFTWARE INDUSTRY OVERVIEW:
CASE STUDIES

PRESENTED TO:
IBM SOFTWARE ENGINEERING INSTITUTE

DECEMBER 1, 1982

— INPUT —

OVERVIEW

- o Product-oriented companies.
 - Mousetrap builders.
 - . "Build a better mousetrap and the world will beat a path to your door."
 - Era not over.
- o Marketing companies.
 - Doesn't just mean effective selling.
- o Mutually exclusive?

OUTLINE

- o Product-oriented companies.
 - VisiCalc (Software Arts, VisiCorp).
 - Syncsort.
 - SofTech Microsystems.
 - BGS.
- o Industry-oriented applications software.
 - Insurance software.
 - . ISA.
 - . PMS.
 - User needs.
- o DBMS software.
 - Cincom.
 - Cullinane.
 - Software AG.

OUTLINE - (continued)

- o Financial Software.
 - MSA.
 - McCormack and Dodge.
- o Software maintenance.
- o A software startup.

MOUSETRAPS

- o Three kinds of mousetraps:
 - The "first" mousetrap (e.g., VisiCalc).
 - A "better" mousetrap (e.g., Syncsort).
 - "Another" mousetrap (e.g., IDMS).
 - All do a good job.
- o Mousetrap perceptions are at least as important as reality.
- o Mousetraps are a combination of:
 - Product.
 - Strategy.
 - Timing (i.e., luck).



FIRST MOUSETRAPS

- o Quality and performance are irrelevant beyond a certain point.
For example:
 - Personal computer world.
 - . VisiCalc.
 - . CP/M.
 - . Microsoft BASIC.
 - Much IBM software.
- o "Fustes with the Mostes."
- o A rising tide floats all ships.

VISICALC

- o Dan Bricklin (Software Arts) had insight and developed product.
- o Dan Fylstra (VisiCorp, formerly Personal Software) obtained marketing rights.
- o Price strategy: inspired.
- o Are these one-shot companies?
 - VisiCorp: Visi-family.
 - Software Arts: TK-solver.
 - A equation framework modeled conceptually on VisiCalc.

OTHER FIRST MOUSETRAPS

- o Digital Research: CPM.
 - Conscious decision to adapt it to every microprocessor implementation.
- o Microsoft: Microsoft Basic.
 - A million copies sold.
 - Similar blanket-the-market approach.

1. The first part of the paper is devoted to a general discussion of the problem.

2. In the second part, we consider the case of a single variable.

3. The third part is devoted to the case of several variables.

4. In the fourth part, we consider the case of a function of several variables.

5. The fifth part is devoted to the case of a function of several variables.

6. In the sixth part, we consider the case of a function of several variables.

7. The seventh part is devoted to the case of a function of several variables.

8. In the eighth part, we consider the case of a function of several variables.

9. The ninth part is devoted to the case of a function of several variables.

10. In the tenth part, we consider the case of a function of several variables.

11. The eleventh part is devoted to the case of a function of several variables.

12. In the twelfth part, we consider the case of a function of several variables.

13. The thirteenth part is devoted to the case of a function of several variables.

14. In the fourteenth part, we consider the case of a function of several variables.

15. The fifteenth part is devoted to the case of a function of several variables.

16. In the sixteenth part, we consider the case of a function of several variables.

17. The seventeenth part is devoted to the case of a function of several variables.

18. In the eighteenth part, we consider the case of a function of several variables.

19. The nineteenth part is devoted to the case of a function of several variables.

20. In the twentieth part, we consider the case of a function of several variables.

BETTER MOUSETRAPS

- o Often one product companies.
- o Syncsort Inc.
 - Advertising for new documentation package has to contain a sentence, "This is not a sort package."
 - Name changed from Whitlow Systems several years ago.
- o SofTech Microsystems.
 - SofTech subsidiary.
 - Personal computer operating environment: UCSD p-System.
 - Licensed from UC San Diego.
 - . Fully portable applications.
 - But a late entrant (CPM, MS-DOS).
 - . Aggressive marketing.

BGS SYSTEMS: A BETTER MOUSETRAP

- o Academic founders: 1975; (Buzen, Goldberg, Schwenk: Math PhD's).
 - Initially, computer performance consulting.
- o Foundation product: BEST/I in 1978.
 - Computer system capacity projection tool.
 - Application of queueing theory modeling approach.
 - . In contrast to simulation approaches (e.g., SNAP SHOT).
- o Added companion products.
- o Rapid acceptance.
- o Excellent marketing and support.
 - Good materials.
 - Mix users and prospects.
 - Limitation: Technical staff are best salesmen.

A TALE OF TWO INSURANCE APPLICATIONS VENDORS

- o Insurance Systems of America (ISA).
 - Formed in 1969 by 15 insurance companies.
- o Policy Management Systems (PMS).
 - EDP organization within an insurer: Seibels, Bruce and Company.
 - Began offering services commercially in 1974.

PRODUCT ANALYSIS

- o Not mousetrap-type products.
 - Expensive.
 - Unwieldy.
 - Marginal improvements to many in-house systems.
- o Often used as a framework in large customers.
- o Usually too large for smaller companies.
- o Market often assumed to be thousands of companies.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

FINANCIALS

REVENUES (\$ MILLIONS)

	<u>1979</u>	<u>1980</u>
ISA	\$17.0	\$22.0
PMS	\$12.5	\$16.7

- o ISA sold to United Telecom in 1981 for \$40 million.
- o PMS spin off in public offering in 1982.

ISA PRODUCT MIX - 1981

SHARE OF
WEIGHTED
PRODUCT BASE

o	Financial products	51%
-	Accounting and budgeting	29%
-	Cash disbursements	7%
-	Modeling	2%
-	Stock and bond (batch)	9%
-	Stock and bond (on-line)	4%
o	General software	6%
-	Report writer	1%
-	File maintainer	5%
o	Insurance software	43%
-	Health	15%
-	Property/casualty	28%

INPUT

ISA - 1982 PRODUCTS

- o Dental claims software.
- o Group insurance administration software.
- o Apple-based life agent quotation product.

1982: A YEAR OF DISASTER FOR ISA

- o Current property/casualty (personal lines) business sold at loss.
- o Commercial lines property/casualty system under development sold.
- o Withdrew from marketing health insurance software.
- o Dropped dental and group software.
- o New strategy: Focus on all industries.
- But:
 - . Products obsolescent.
 - . Salesforce = ?

PMS SUCCESS: WHY?

- o Product adequate, at best.
- o Customers barely satisfied.
- o A single product focus.
 - Processing/software synergy.
- o Aggressive selling.
- o High prices, obligatory maintenance.
- o Strong management.
- o Investment from parent.

ISA FAILURE: WHY?

- o Products not always adequate.
- o Customers barely satisfied.
- o Salesforce turnover.
- o Lower prices.
- o Variable management.
- o No new investment after 1969.
- o ISACOMM subsidiary distraction.
- o No product focus.
 - Market sizing.

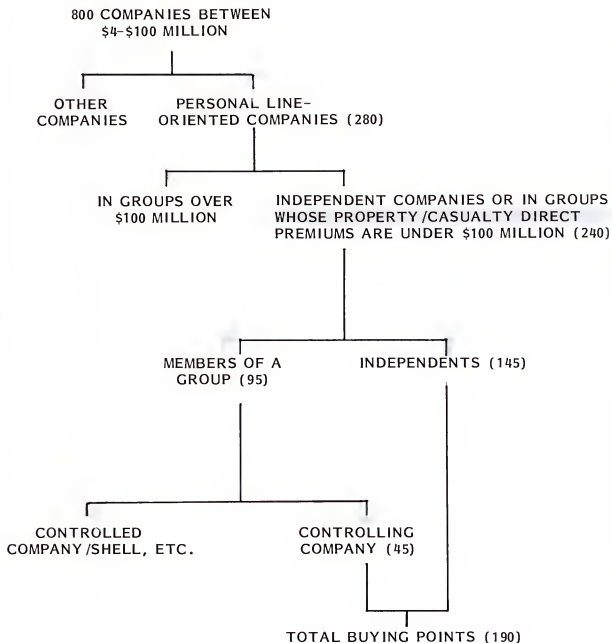


PROPERTY/CASUALTY COMPANIES

<u>COMPANY TYPE</u>	<u>NUMBER OF COMPANIES</u>	
Stock companies	-	1,000
Under 2 million (direct premiums)	800	-
Over \$2 million (direct premiums)	800	-
Mutual companies	-	1,600
"Leading" mutuals (per best)	300	-
Other mutuals	1,300	-
Other (Lloyds, Reciprocal, Factory mutuals)		75
TOTAL	-	2,575

INPUT

INSURANCE MARKET SEGMENTATION



INPUT

**IMPORTANCE OF VENDOR SELECTION
FACTORS TO COMPANIES**

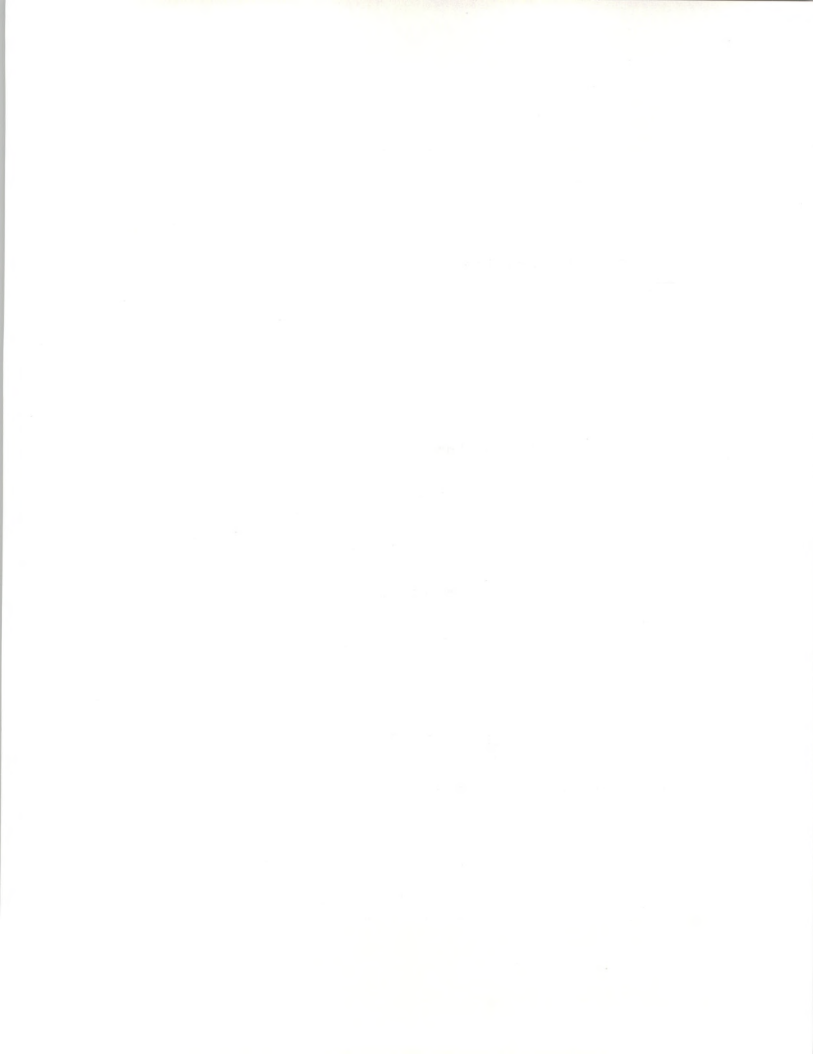
<u>RANKING OF FACTOR</u>	<u>FACTORS</u>	<u>COMMENTS</u>
High	System reliability Time and effort to implement Flexibility User control Support and training	Factors are important after acquisition Involve implementation and operation
Medium-High	Reputation/references Cost System features	Factors are important before acquisition
Medium	Response time Vendor size	Response time important to those going on-line
Medium-Low	Numbers of current customers Geographic location of vendor	

DBMS SOFTWARE

- o Major DBMS vendors profiles very similar:
 - Cincom (Total).
 - Cullinane (IDMS)
 - Software AG (ADABAS).
- o Each DBMS product was introduced around 1970.
 - Good products, but did not represent breakthroughs.
 - Each was "another mousetrap."
 - Small start-ups.

DBMS SOFTWARE - (continued)

- o Success due to:
 - Market need.
 - Intensive marketing.
 - Lack of an unquestioned leading product.
 - Personal force of top executive.
- o Each company aware of "topping out syndrome."
 - Expand into a family of products.
 - Add applications (Cullinane, Cincom).
 - Add processing (Cullinane).
- o Foundation to other packages.



CINCOM SOFTWARE PRODUCTS

PRODUCT NAME	DESCRIPTION	TYPICAL PRICE
<u>Systems Software</u>		
TOTAL	Data base management system (DBMS)	\$ 70,000 (Mainframes) \$ 20,000 (Minicomputers)
ENVIRON/I	Teleprocessing monitor	\$ 50,000
MANTIS	Interactive applications development	\$ 35,000
DCS (Data Control System)	Data dictionary/applications development	\$ 45,000
T-ASK	Interactive DBMS query facility	\$ 37,000
SOCRATES	Report generator	\$ 27,500
LMS-II	On-line editor and library system	\$ 23,500
ENV-DATA	On-line data entry system	\$ 16,800
TIS (Total Information System)	Directory-driven DBMS, query, report writer, TP monitor, and utilities system	\$250,000
<u>Applications Software</u>		
MRPS (Manufacturing Resource Planning System)	Manufacturing control system	\$150,000
EPOCH-FMS	Financial applications development system	\$100,000

CULLINANE SOFTWARE PRODUCT OFFERINGS

PRODUCT	FUNCTION	NUMBER INSTALLED
<u>DATA BASE SOFTWARE</u>		
• IDMS	DATA BASE MANAGEMENT SYSTEM	800+
• IDD	INTEGRATED DATA DICTIONARY	600+
• IDMS-DC	TELEPROCESSING MONITOR	145
• - UNIVERSAL COMMUNICATIONS FACILITY (UCF)	IDMS TELEPROCESSING MONITOR INTERFACE	12
• APPLICATIONS DEVELOPMENT SYSTEMS (ADS)		
• - ADS-BATCH	BATCH APPLICATIONS DEVELOPMENT TOOL	10
• - ADS-ONLINE	ON-LINE APPLICATIONS DEVELOPMENT TOOL	NEW
• - INTERACT	ON-LINE INTERACTIVE EDITING, TEXT PROCESSING AND RJE SYSTEM	90
• IDMS/CULPRIT	DATA RETRIEVAL AND REPORT GENERATOR	650
• ONLINE QUERY	INTERACTIVE INFORMATION RETRIEVAL SYSTEM	375+
• ONLINE ENGLISH (OLE)	ENGLISH-LANGUAGE QUERY FACILITY	10
• DISTRIBUTED DATA BASE SYSTEM	DISTRIBUTED DATA BASE SYSTEM	10
• ESCAPE PRODUCTS	NON-IDMS APPLICATION INTERFACE	5
• IDMS-DMS INTERFACE	IDMS-CICS DMS/VS INTERFACE	10
<u>AUDIT SOFTWARE</u>		
• INFORMATION DIRECTORY	CENTRAL DICTIONARY/DIRECTORY FOR AIMS	5
• EDP-AUDITOR	AUDIT SOFTWARE PACKAGE	500
• - EDP-AUDITOR 13	AUDIT PACKAGE FOR IBM SYSTEM 13	50
• CARS	AUDIT INFORMATION RETRIEVAL SYSTEM	650+
<u>APPLICATION SOFTWARE</u>		
• CUSTOMER INFORMATION SYSTEM (CIS)	ON-LINE CUSTOMER INFORMATION SYSTEM FOR BANKS	3(NEW)
• CULLINANE INTEGRATED MANUFACTURING SYSTEM (CIMS)	ON-LINE COMPREHENSIVE MANUFACTURING SYSTEM	NEW



SOFTWARE AG SYSTEMS GROUP, INC.

PRODUCT	DESCRIPTION	PRICE	CPU REQUIREMENTS* (OPERATING SYSTEM)
ADABAS	Data Base Management System	\$ 99,000- \$160,000	All IBM Operating Systems
ADABAS/VM	ADABAS VM Option	\$ 24,000	DOS, DOS/VSE, OS/VSI, OS/MVS, CMS
ADABOMP	Bill of Materials Processor	\$ 48,000	All DOS and OS
COM-LETE	Teleprocessing System	\$ 36,000- \$ 90,000	OS/MVT, OS/VSI, OS/SVS, OS/MVS
NATURAL	Interactive Programming Language	\$ 36,000- \$ 48,000	All IBM Operating Systems
ADABAS-M	ADABAS for Minicomputers	\$ 40,000	DEC PDP-11 Models 34-70, VAX-11/750, VAX-11/780 or Compatible; IAS, RSX-11, VMS
The Data Base Machine	Backend DBMS Processor	\$297,000- \$397,000	OS/VSI, OS/MVS
Channel-to-Channel Communications System	Communications Software	\$ 65,000	OS/VSI, OS/MVS



MSA

- o Near bankruptcy in early 1970's.
- o Now largest independent: 5% of applications market.

MANAGEMENT SCIENCE AMERICA, INC.

Annual Report
for the year ended December 31, 1981

Selected Financial Data

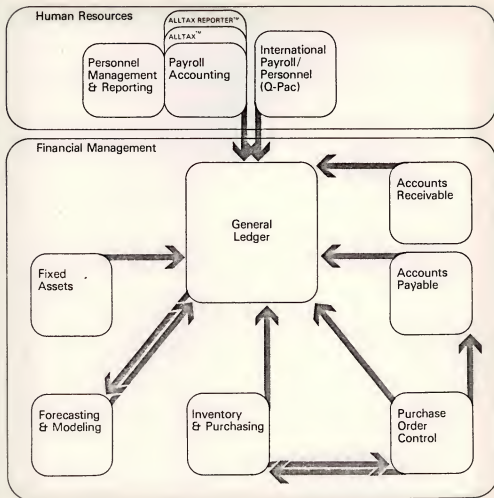
HIGHLIGHTS OF THE YEAR	1981	1980*	1979*	1978	1977
<i>(In thousands, except per share amounts)</i>					
Revenues	\$73,139	\$53,724	\$39,397	\$26,160	\$17,443
Income before provision for income taxes	10,112	5,360	5,466	2,427	1,579
Net income	5,487	2,912	2,591	1,134	786
Earnings per common share	\$.83	\$.53	\$.46	\$.20	\$.13
AT END OF YEAR	1981	1980*	1979*	1978	1977
<i>(In thousands, except employees)</i>					
Working capital	\$24,755	\$ 5,890	\$ 5,421	\$ 3,822	\$ 2,541
Total assets	51,876	28,637	16,795	11,395	8,598
Notes payable	2,265	6,143	446		
Shareholders' equity	34,634	10,782	7,911	6,191	5,062
Employees	1,002	832	653	458	328



MSA GROWTH STRATEGY - 1970'S

- o Shed everything but financial software.
- o Stress integration.
- o Marketing.

MSA MAINFRAME PRODUCT INTEGRATION





MSA COMPETITION

- o Software International (recent GE acquisition)
- o McCormack and Dodge: most dynamic.

MSA VERSUS MCCORMACK AND DODGE

	<u>MSA</u>	<u>McCormack And Dodge</u>
1978 Revenues (million)	\$26.2	\$ 3.1
1981 Revenue (million)	\$73.1	\$26.0
Percent Increase	179%	739%
Fortune 500 penetration (1981)	56%	42%

- o McCormack and Dodge.
 - Newer products.
 - High commissions.

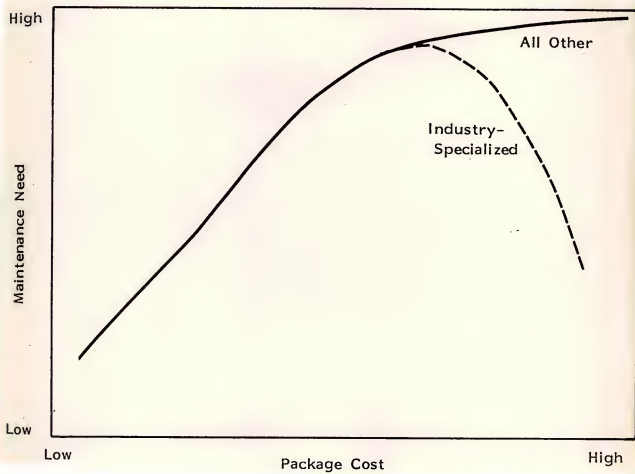
MSA GROWTH STRATEGY - 1980'S

- o Financial software still core.
 - Flesh out existing product line.
 - Step down to 4321/31-sized organization.
 - Peachtree software acquisition (1981).
- o Manufacturing Planning and Control.
 - Arista subsidiary of Xerox acquired (1982).
 - Eventually, integration with financial systems.
- o International expansion.
 - International share of new business.
 - . 1977: 3%
 - . 1981: 21%
 - Q-Pac acquisition (1980).

IMPORTANCE OF SOFTWARE MAINTENANCE

- o Software maintenance over 20% of MSA's revenues.
 - Still increasing revenue share.
- o Highly leveraged.
- o Importance depends on price, application area.

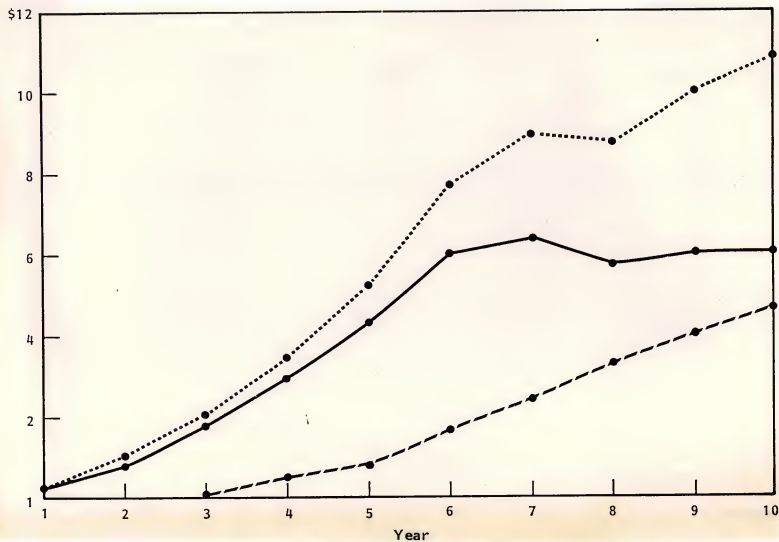
SOFTWARE MAINTENANCE NEEDS





REVENUE COMPOSITION FOR A HYPOTHETICAL
SOFTWARE PRODUCT

SALES
(\$ millions)



..... = Total Revenue — = Package Revenue - - - = Maintenance Revenue



HYPOTHETICAL SOFTWARE PRODUCT: TEN-YEAR HISTORY

ASSUMPTIONS

- o Peak sales in year six.
- o Introductory price intentionally low; raised to market price in year three; 10% annual increase until year nine.
- o No charge for maintenance first year after sale; thereafter, assumed that all customers are under maintenance.
- o Annual maintenance cost is 12% of the sales price in the same years.

TEN-YEAR SOFTWARE PACKAGE AND MAINTENANCE
REVENUE FOR A HYPOTHETICAL PRODUCT

YEAR	UNITS SOLD	PRICE/ UNIT (\$ thousands)	PACKAGE REVENUE (\$ thousands)	UNITS UNDER MAINTENANCE	MAINTENANCE PER UNIT (\$ thousands)	MAINTENANCE REVENUE (\$ thousands)	TOTAL REVENUE (\$ thousands)	MAINTENANCE PERCENT OF TOTAL
1	20	\$10	\$ 200	0	0	0	\$ 200	0
2	60	15	900	20	\$1.8	\$ 36	936	4%
3	100	18	1,800	80	2.2	176	1,976	9
4	150	20	3,000	180	2.4	432	3,432	13
5	200	22	4,400	330	2.6	858	5,258	16
6	250	24	6,000	530	2.9	1,537	7,537	20
7	250	26	6,500	780	3.1	2,418	8,918	27
8	200	28	5,600	930	3.4	3,162	8,762	36
9	200	30	6,000	1,130	3.6	4,068	10,068	40
10	200	30	6,000	1,330	3.6	4,788	10,788	44



A SOFTWARE START-UP -- BACKGROUND

- o The product: Modeling software for a well-known small system.
 - May be a better mousetrap.
 - Order of magnitude better than VisiCalc?
- o Developer profile:
 - "Demon programmer."
 - High energy levels.
 - No self doubt.
 - Full time job until recently.

SOFTWARE START-UP – TAKE OFF

- o Implemented on one vendor's hardware.
 - Vendor cooperating.
- o License agreement with foreign manufacturer.
- o Considering other implementations.
- o Received financing from private investor.
 - Brought together by common acquaintance.
 - Additional financing from limited partnership.

TAKE OFF OR CRASH?

Pluses

- o Definite window of opportunity.
- o At the least, a superior mousetrap.
- o Can be priced at VisiCalc multiples.
- o Hardware vendor cooperation.

Minuses

- o If principal hit by car.
- o A flood of independently conceived look-a-likes.
- o Principal unable/unwilling to expand fast enough?

CONCLUSIONS

- o Dynamic environment.
 - Hard to forecast winners.
- o 1970's: Product, sales.
- o 1980's: Distribution channels, support productivity.

